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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/001,800	12/05/2001	Tomio Sugiyama	2635-40	2313
7590 03/04/2004			EXAMINER	
NIXON & VANDERHYE P.C. 8th Floor 1100 North Glebe Rd. Arlington, VA 22201-4714			OLSEN, KAJ K	
			ART UNIT	PAPER NUMBER
			1753	

DATE MAILED: 03/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/001,800

Applicant(s)

SUGIYAMA ET AL.

Examiner

Kaj Olsen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 December 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-11 are rejected under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, as obvious over Fujii et al (USP 5,766,434) as evidenced by the applicant's disclosure. Making the rejection be a 102 or 103 over the reference was necessitated by new claims 3, 4, and 11.
3. Fujii discloses a gas sensing element that comprises a solid electrolyte 12 with a measured gas side electrode 131 exposed to the gas being measured as well as a reference gas side electrode 132 provided on another surface of the solid electrolyte substrate (fig. 1). Fujii also discloses a porous protective layer 11 covering the measuring gas side electrode (fig. 1). Although Fujii does not explicitly recite whether the layer has the set forth limit current density, Fujii does teach the use of a thickness for the protective layer 11 of 100 to 300 microns (col. 7, lines 16-19) as well as an average pore size diameter of 0.01 to 0.3 microns (paragraph bridging col. 9 and 10). This combination of pore diameters and thickness overlaps the layer thickness range and pore diameter range that provided the gas permeation rates the applicant has stated provides the claimed limit current density of the claim (fig. 8 in conjunction with p. 14, lines 17-25). Hence, the protective layer of Fujii would appear to inherently possess the claimed limit current density.

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4. With respect to the integration of the elements of the claim, it would appear that the electrode protection layer is integrated with the lamination body.
5. With respect to sintering the elements of the sensor together, the determination of patentability for the claim is based on the product itself. Because the product of the claim is identical to the invention of Fujii the process from which it was made is the same as or obvious over the process utilized by Fujii (see *In re Thorpe*, 777 F.2d 695, 698).
6. With respect to the heater and reference gas chamber, see fig. 8 and col. 12, lines 1-15.
7. With respect to the new limitations concerning the thickness, pore diameters, and permeation rates, see col. 7, lines 16-19 and paragraph bridging col. 9 and 10. The permeation rates would appear to be a function of the pore diameter and thickness of the protective layer, which Fujii taught (see above).
8. Although Fujii might not have taught the thickness and average pore diameter with sufficient specificity to meet the limitations of claim 11, it would have been obvious to one having ordinary skill in the art at the time the invention was made to Describe modification and press the F9 key~, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Claim Rejections - 35 USC § 103

9. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

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10. Claims 1-11, in the alternative, are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujii in view of Mase (USP 5,169,513). Mase is being cited and relied on for the first time with this office action. Its use here was necessitated by applicant's arguments that how Fujii was constructed distinguishes the teaching of Fujii over the claims (see Response to Arguments below).

11. Fujii set forth all the limitations of the claim, but did not suggest integrally sintering the sensor. Mase teaches in an alternate sensor that the use of integral and sequential sintering are both analogous means for arriving at gas sensing structure (col. 4, line 50 through col. 5, line 11). It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Mase and integrally sinter the sensor of Fujii because both integral and sequential sintering are analogous means for arriving at the claimed structure.

Response to Arguments

12. Applicant's arguments filed 12-4-2003 have been fully considered but they are not persuasive. With respect to the rejection utilizing Fujii, applicant urges that just because Fujii overlaps the pore diameter and thickness of the instant invention, that does not indicate that Fujii would teach the claimed conditions. In particular, applicant points out that Fujii uses a slurry dip to arrive at the specified porous protective layer whereas the instant invention which utilizes a integral sintering. However, it is unclear to the examiner how this somehow obviates the rejection with Fujii. Regardless of whether Fujii integrally sinters the device or sinters in stages doesn't change that Fujii arrives at the same layer thickness and porosity as that of the instant invention. What does integrally sintering the device provide that sequential sintering doesn't

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when they arrive at the same specified structure? The examiner would point out that the uses of both integral and sequential sintering are considered analogous in the art (see Mase '513). If applicant wishes to file a declaration stating that the use of integral sintering provided an unexpected claimed result that would not have been accomplished using sequential heating steps of Fujii, applicant is invited to do so. However, merely pointing out the differences in how the reference arrived at the final structure versus the instant invention, without explaining why the differences would not have provided the claimed properties, is not persuasive.

13. In the first paragraph of p. 7 of the response, applicant mentions Nakano. The examiner believes the applicant meant Fujii (Nakano isn't discussed until p. 8) and the examiner has interpreted it as such.

14. Applicant urges that just because Fujii teaches the pore diameters and thicknesses that yield the claimed structure does not mean that Fujii inherently has the claimed properties. However, a fair reading of p. 14 would appear to indicate that the key parameter that arrives at the specified limit current density is the pore diameter and thickness. The examiner's conclusion is further reinforced by the teaching of Logothetis where they explain that limit-current is a function of the structure of the diffusion limiting layer (pp. 141-144, especially the paragraphs containing equations 11 and 12). Logothetis is being cited for the first time here for clarification of the examiner's position. Hence, it would appear to the examiner that if the prior art taught the specified pore diameters and thickness, then the prior art anticipates the claimed range. If the applicant believes the examiner is in error with his interpretation of the applicant's disclosure and of Logothetis, then the applicant is invited to explicitly explain how the examiner is in error.

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15. Applicant also urges that the applicant's discovered what happens when the limit current density is less than 0.04 or greater than 0.15 mA/mm². That may be the case, but if the prior art already disclosed structure that provides that set forth limit current density, then the prior art anticipates the claimed sensor. It has been well established that a patent cannot be given for the discovery of a new reason for doing what the prior art already disclosed.

16. Applicant's argument concerning Nakano and the use of the gas shielding layer were persuasive. The examiner has withdrawn that rejection.

17. The examiner will also withdraw the rejection utilizing Kato because of Kato's use of a plurality of porous portions rendering it unclear if the overall sensor permeability would match the permeability given col. 2, lines 14-17 of the reference.

Conclusion

18. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaj Olsen whose telephone number is (571) 272-1344. The examiner can normally be reached on Monday through Thursday from 7:00 A.M. to 4:30 P.M. and on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen, can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Kaj Olsen', with a stylized flourish extending to the right.

Kaj Olsen Ph.D.
Primary Examiner
AU 1753
February 24, 2004